Relationship between stress hyperglycemia ratio and long-term poor prognosis in patients with multi-vessel coronary artery disease

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Background: Stress hyperglycemia ratio (SHR) is a new biomarker of true acute hyperglycemia, which is significantly related to emergency cardiovascular events. However, the relationship between SHR and long-term prognosis of patients with multi-vessel coronary artery disease has not been reported. The purpose of this study is to clarify the relationship between SHR and long-term clinical outcomes in patients with multi-vessel coronary artery disease (MVD).

Methods: A total of 1719 patients with multi-vessel coronary artery disease were included in the final analysis of this study. Patients were divided into three groups according to the SHR quartile: SHR1 group (SHR ≤ 0.913), n=573; SHR2 group (SHR 0.913-1.215), n=573; and SHR3 group (SHR ≥ 1.215), n=573). All patients were followed up. The main end point was 5-year all-cause mortality. The secondary end point was the major cardiovascular and cerebrovascular adverse event (MACCE), defined as the combined result of 5-year all-cause death, myocardial infarction, stroke and subsequent coronary revascularization. Cox regression and Kaplan-Meier curve analysis were used to evaluate the relationship between SHR and all-cause mortality and MACCE. Logistic regression analysis and subject working curve (ROC) analysis were used to obtain the optimal critical value of SHR for predicting all-cause mortality and MACCE.

Results: During the average follow-up period of 4.5 years, 131 patients died of all causes, 121 patients suffered from myocardial infarction, 55 patients suffered from stroke and 247 patients underwent coronary artery revascularization. Compared with SHR1 and SHR2 groups, the all-cause mortality and MACCE in SHR3 group were significantly increased (4.36% and 8.03% and 10.47%; 20.94% and 31.06% and 44.68%, P<0.001, respectively). Kaplan-Meier curve showed that compared with SHR2 and SHR1 patients, SHR3 patients had the highest all-cause mortality and MACCE risk (Logarithmic ranking P<0.001). Multivariate Cox regression analysis showed that SHR was associated with a 1.462 and 1.205 fold increase in all-cause mortality and MACCE risk (HR 1.462; 95% CI 1.104-2.159; HR 1.205; 95% CI 1.073-1.932; P<0.001). ROC curve analysis showed that the best SHR threshold for predicting all-cause mortality and MACCE were 0.92 and 1.03, respectively.

Conclusion: Our data show for the first time that SHR is independently associated with poor long-term prognosis in patients with multi-vessel coronary artery disease. The best SHR thresholds for predicting all-cause mortality and MACCE in patients with MVD were 0.92 and 1.03, respectively. These findings suggest that SHR may play a potential role in the cardiovascular risk stratification of patients with MVD.